Lockheed Aeronautical Systems Company

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A Division of Lockheed Corporation Burbank, California 91520

February 5, 1988

EA889/88

California Regional Water Quality Control Board Los Angeles Region 107 South Broadway, Suite 4027 Los Angeles, California 90012-4596

Attention: Mr. Hank H. Yacoub

Supervising Water Quality

Control Engineer

Subject: LASC Groundwater Monitoring Program, Plant A-1

Plant B-6, Plant B-1 and Plant C-1

Reference: Cleanup and Abatement Order 87-161, Revised 12/22/87

Enclosure: Interim Work Plan for Groundwater Monitoring

Wells in Areas 1, 2 and 3, Plants A-1, B-1 and B-6

Dear Mr. Yacoub:

On December 30, 1987, LASC submitted a map showing five (5) recommended areas for the installation of additional groundwater monitoring wells at Plants A-1, B-1 and B-6. This map was accompanied by a brief discussion of the site selection rationale.

This is to acknowledge receipt of your letter of January 6, 1988 granting approval to proceed with the installation of the proposed cluster wells in "Areas 1, 2, and 3".

The enclosure "Interim Work Plan" is intended to provide the Board with the basic details of the well construction, health/safety plan and the sampling/analysis plan for the initial well installations. Figure 1 shows the location of the cluster wells in "Area 1". The locations of the cluster wells in "Areas 2 and 3" will be provided at a later date.

Please contact me at (818) 847-5024 if you have any questions regarding this submittal.

Sincerely,

LOCKHEED AERONAUTICAL SYSTEMS COMPANY

D.N. Urquhart, Director Environmental Affairs

DATE . ~~

California Regional Water Quality Control Board Mailing List

- Mr. Nestor O. Acedera, California Department of Health Services, Toxic Substances Control Division
- Mr. Melvin L. Blevins, Watermaster, Upper Los Angeles River Area
- Mr. Robert S. Ford, State Water Resource Control Board
- Mr. Joseph L. Hegenbart, Los Angeles Department of Water and Power
- Mr. Mike Hopkins, Glendale Public Service Department
- Mr. Bruce Kuebler, Los Angeles Department of Water and Power, Water Quality Division
- Mr. Fred Lantz, Water Operations Manager, Burbank Public Service Department

INTERIM WORK PLAN

Groundwater Monitoring Well Installations Plants A-1, B-1 and B-6

Submitted to:

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD Los Angeles Region

By:

LOCKHEED AERONAUTICAL SYSTEMS COMPANY Burbank, California 91520

Prepared by:

URS Consultants, Inc. Long Beach, California 90802

February 5, 1988

INTERIM WORK PLAN

GROUNDWATER MONITORING WELL INSTALLATIONS

PLANTS A-1, B-1 & B-6

INTRODUCTION

This document is an interim work plan for the installation of groundwater monitoring cluster wells (piezometers) at LASC Plants A-1, B-1 and B-6. The work plan is comprised of:

- 1. Monitoring well locations with site map
- 2. Monitoring well installation with typical well completion diagram
- 3. Sampling and analysis plan
- 4. Site health and safety plan

MONITORING WELL LOCATIONS

The cluster wells at Plant B-1 will be installed in an area directly east of Building 170 (see Figures 1 and 2). At this time, the exact locations for the groundwater monitoring wells in areas 2 and 3 (see Figure 1) have not been established, but they will be situated within the areas designated on the map. If the analytical results technically support changes in proposed well locations, depths, or numbers of wells in the clusters, LASC will so advise the Board and obtain approval for any such amendments to the plan.

MONITORING WELL INSTALLATION

A typical well completion diagram is presented in Figure 3. All wells will be completed at the approximate target depths shown in Table 1 using a Mud-Rotary Porta-Drill (Model TKT or TLS).

TABLE 1

WELL COMPLETION DEPTHS

AREA 1	AREA 2	AREA 3
600 Feet	600 Feet	600 Feet
260 Feet	260 Feet	320 Feet
160 Feet	160 Feet	220 Feet

For installation of the 600-foot well, the drill cuttings will be logged and the well installed under the supervision of a geologist. The geologist will log the drill cuttings as they are brought to the surface with the drilling mud. The geologist will log soil type using the Unified Soil Classification System (see Figure 4). In

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addition to soil type, the geologist will also log soil color, texture, density, grain size, and moisture content. An example of the field log is shown as Figure 5. It is anticipated that a sample of the drill cuttings will be logged every five feet. Following completion of the borehole, an electric log (E-log) consisting of SP, point resistivity, 6-foot lateral, gamma log, and caliper survey will be obtained from the borehole. The E-log will be compared with the drill cutting data to identify the most permeable and least permeable zones so that the placement of well screens can be optimized. The E-log information will be developed by Geo-Hydro-Data, Inc. (Tehachapi, California).

Before drilling, the drilling rods, bits and stabilizer rod will be steam cleaned. The pumping system will be cleaned with a tri-sodium phosphate solution and flushed with fresh water. Waste aqueous tri-sodium phosphate solution will be collected in a Baker Tank with other fluids from the drilling operation.

Individual groundwater monitoring wells will be screened at the bottom of each boring with five to ten feet of 5-inch diameter 20-slot (0.02), stainless steel (Type 304) pipe. Five-inch stainless steel blank casing will extend from the top of the screened interval to the land surface.

Prior to cement sealing, centralizers will be installed to ensure the equal spacing around the well casing, which will allow optimum utilization of the annular space. The annular space surrounding the screened interval will be packed with coarse sand (Lone Star #3). The annular space above the sand pack will consist of an approximate 4-foot bentonite seal. The remaining annular space will be filled with cement seal consisting of 5% bentonite.

Following installation of the monitoring wells, the wells will be developed by bailing with a suction bailer, swabbing with a rubber swab, and pumping with a submersible pump. The well will be considered developed when the pH and conductivity of the formation water have stabilized, and the water shows little or no signs of turbidity.

Well construction methods and materials will be in accordance with applicable standards, regulations and permitting requirements.

The wells will be completed with a locking cap set in a Christie-box, which will be set above grade and sealed with concrete sloped to finish with surrounding pavement.

All cuttings will be discharged from the mud system to a roll-off dumpster and all fluid will be transferred to a Baker Tank via vacuum truck. All fluids and cuttings will be held in Baker Tanks and dumpsters until a chemical analysis is made. Upon completion of the chemical analysis fluids and cuttings will be hauled off by vacuum truck and/or dumpster trucking and disposed of in the proper manner.

All monitoring well/piezometer locations and elevations shall be surveyed and established in reference to a standard bench mark identified by LASC. The point of reference shall be marked on each well casing. Preferred point of reference is top of well casing, north side.



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SAMPLING AND ANALYSIS PLAN

- A. One sample will be taken from each piezometer and analyzed for volatile organics (30 compounds) by the EPA Method 601 and for volatile aromatic compounds by the EPA Method 602.
- B. 20% QA/QC samples will be taken.
- C. LASC will notify the Board at least 24 hours prior to sampling the well selected for split sampling.
- D. The Board will provide its own containers for the split samples.

SITE HEALTH AND SAFETY PLAN

All site project personnel will be certified with 40 hours health and safety training. In addition, all site project personnel will be enrolled in a medical surveillance program, including at least one baseline physical within the last 12 months. All site project personnel will be briefed at the beginning of the project by the LASC safety officer and provided with information such as emergency phone numbers, procedures to be followed in the event of an emergency, locations of nearest telephones and fire extinguishers, etc. The site health and safety coordinator will brief field personnel on use of safety equipment and personal protection measures.

Some modification of safety equipment (e.g., switching from Poly-Tyvek to standard Tyvek) may be implemented in order to balance concerns for full contaminant protection against concerns for the possibility of heat stroke or other heat stress resulting from the need to wear such protective equipment. Such modifications may be implemented only if approved in advance by the Health and Safety Officer. Even then, all site workers will have full protective equipment immediately available to them, whether required to wear it or not.

If any personnel are required to wear respirators, only NIOSH/MSHA-approved respirators will be used. These will contain high efficiency (HEPA) cartridges approved for removal of organic vapors/acid mists and particulates. All team members will have been pre-fit tested for respirators. Due to possible difficulties in achieving a proper seal between face and mask, persons with facial hair will not be fitted for respirators, nor be allowed to work in areas that may require respiratory protection.

For the fullest protection of site personnel, organic gas/vapor emissions will be monitored at closely-spaced intervals during drilling operations, and the required level of protection upgraded if necessary. Further protection of personnel will be afforded through use of a site log, with a required sign-in and sign-out procedure. This procedure will document the amount of time spent by each team member at the site.

Levels of Protection

Based on what is presently known about this site, Level "A" or "B" protection will not be required. The required protection may fall into Level "C" or "D" as



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described below:

Level C Protection: If Level C protection is required, the following equipment will be used:

- o full-face air purifying respirators with NIOSH-MSHA-approved high efficiency particulate air (HEPA) canisters for acid mists/organic vapors (half-face respirator may be substituted for certain tasks, by approval of Health and Safety Officer).
- o chemically-resistant (Poly-Tyvek) clothing, one piece, long-sleeved (standard Tyvek by approval of the Safety Officer).
- o outer and inner gloves. Inner gloves to be tight-fitting latex or vinyl. Outer gloves of neoprene or nitrile.
- o steel-toe and shank boots (chemical resistant)
- o disposal Tyvek "Booties"
- o neoprene or butyl rubber outer boots
- o hard hat

Level D+ (D-Modified) Protection: Level D+ protection will require the following equipment:

- o safety glasses with side shields (or goggles)
- o standard Tyvek clothing, one piece
- o outer and inner gloves, inner glove to be tight-fitting latex or vinyl, outer gloves of neoprene or nitrile
- o steel-toe and shank boots (chemical resistant)
- o disposable Tyvek "Booties"
- o neoprene or butyl rubber outer boots
- o hard hat
- o also must be <u>immediately available</u>: a half-face air purifying respirator with NIOSH/MSHA-approved high efficiency (HEPA) canisters for acid mists/organic vapors

Level D Protection: Level D protection is the basic "work uniform" which will be used for off-site tasks with little or no potential for contaminant exposure. Tasks in this category include off-site survey work or other nonintrusive off-site work.

The following equipment is required for Level D protection:

- o safety glasses with side shields
- o coveralls
- o gloves
- o steel-toe and shank boots (chemical resistant)
- o hard hat

Figure 3
WELL COMPLETION DIAGRAM FOR MONITORING WELLS
Not to Scale

DATE INSTALLED: __ PREPARED BY: ELEVATION:___ End Cap Christy Box Locking Cap Sanitary Seal Conductor Casing Centralizers Cement/Bentonite Seal 5" Stainless Steel (Type 304) Blank Casing 4' of Bentonite Seal (Pellets) Sand (Lone Star #3) 5" Stainless Steel (Type 304) .020 Screen Stainless Steel Bottom Cap